FIG. 1

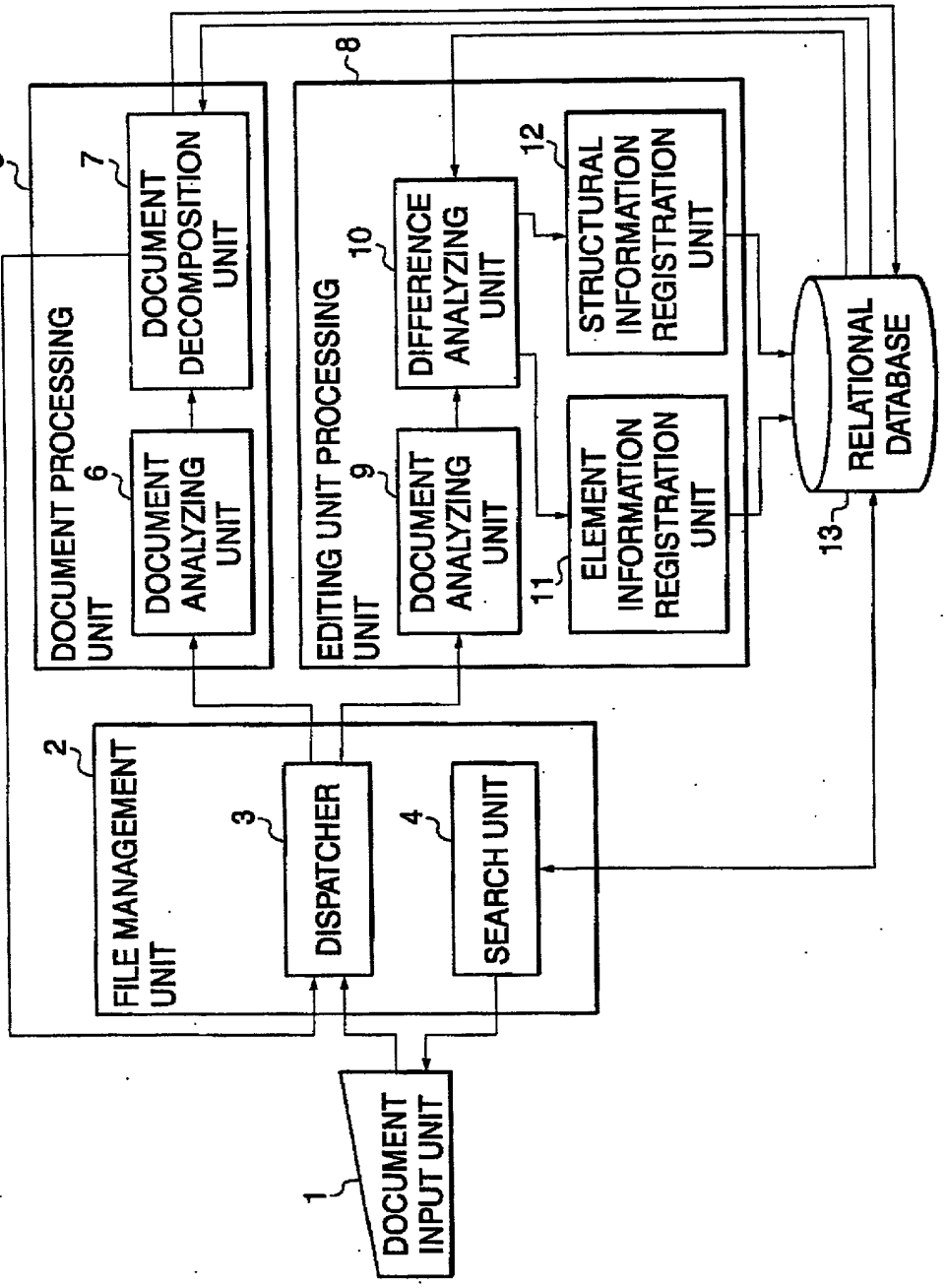
DOCUMENT INPUT UNIT
1
FILE MANAGEMENT UNIT
2
DISPATCHER
3
SEARCH UNIT
4
DOCUMENT PROCESSING UNIT
5
DOCUMENT ANALYZING UNIT
6
DOCUMENT DECOMPOSITION UNIT
7
EDITING UNIT PROCESSING UNIT
8
DOCUMENT ANALYZING UNIT
9
DIFFERENCE ANALYZING UNIT
10
ELEMENT INFORMATION REGISTRATION UNIT
11
STRUCTURAL INFORMATION REGISTRATION UNIT
12
RELATIONAL DATABASE
13

FIG. 2A

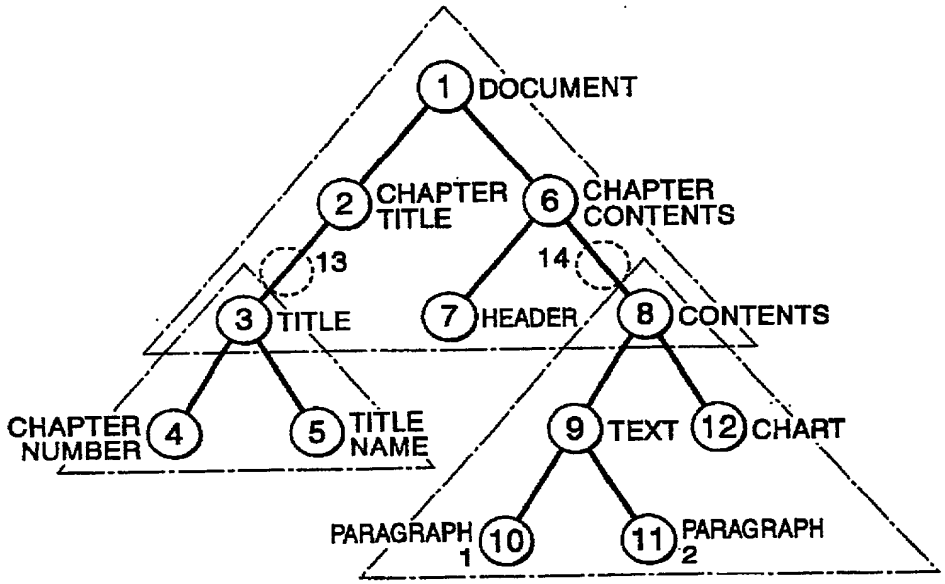
1 DOCUMENT
2 CHAPTER TITLE
6 CHAPTER CONTENTS
13
14
3 TITLE
7 HEADER
8 CONTENTS
CHAPTER NUMBER 4
5 TITLE NAME
9 TEXT
12 CHART
PARAGRAPH 1 10
11 PARAGRAPH 2

FIG. 2B

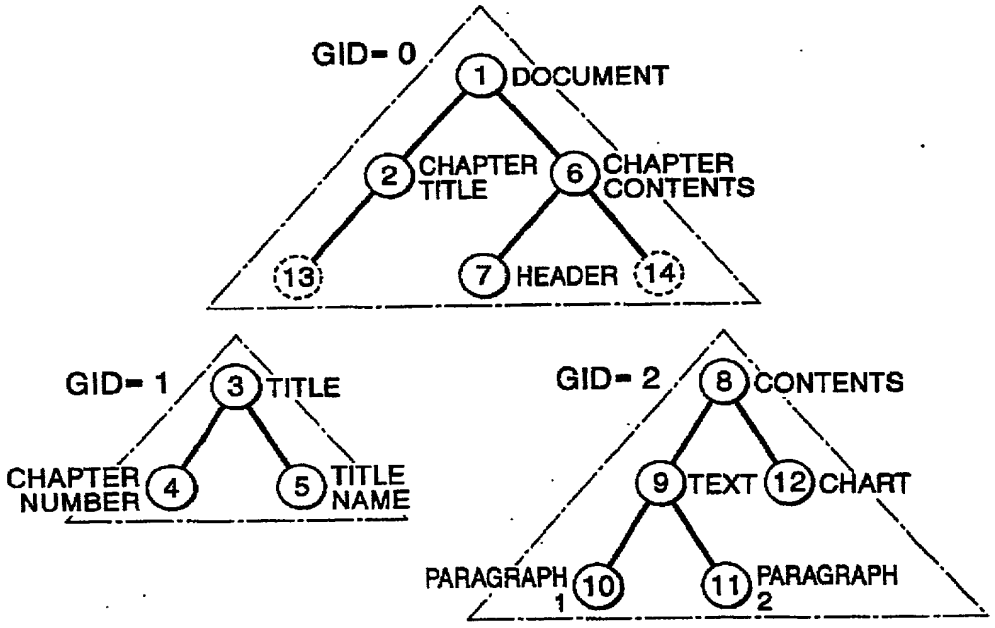
GID= 0
1 DOCUMENT
2 CHAPTER TITLE
6 CHAPTER CONTENTS
13
7 HEADER
14
GID= 1
3 TITLE
CHAPTER NUMBER 4
5 TITLE NAME
GID= 2
8 CONTENTS
9 TEXT
12 CHART
PARAGRAPH 1 10
11 PARAGRAPH 2

FIG. 3A

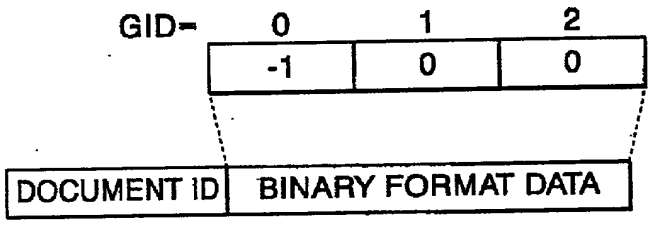

FIG. 3B

GID= 2

SNo	LNo	ELEMENT NAME	ATTRIBUTE VALUE
8	0	CONTENTS	.....
9	1	TEXT	.....
10	2	PARAGRAPH 1	.....
11	3	PARAGRAPH 2	.....
12	4	CHART	.....

FIG. 3C

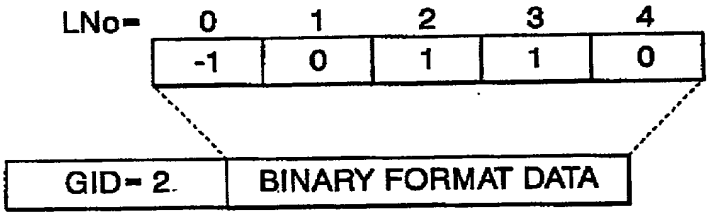

FIG. 4A

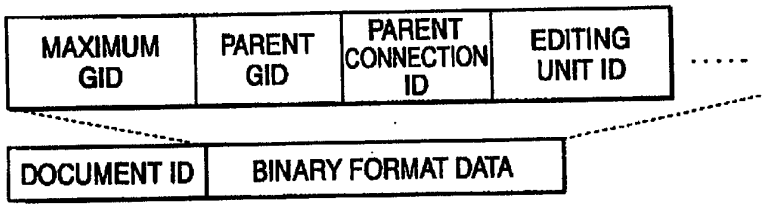

FIG. 4B

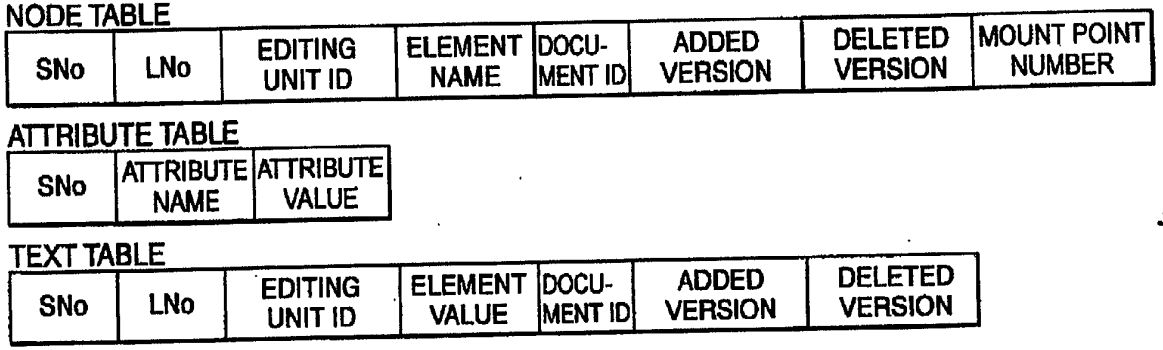

FIG. 4C

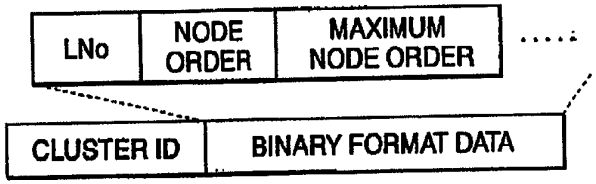

FIG. 4D

FIG. 5A

```
<BOOK ID= "F00000000000000" >
<TITLE ID= "F00000000000001" >READING= "BOOK TITLE"
<PARA ID= "F00000000000002" >BOOK TITLE</PARA>
</TITLE>
<PART ID= "F04000000000000" >
<TITLE ID= "F04000000000002" >READING= "PART TITLE"
<PARA ID= "F04000000000003" >PART TITLE</PARA>
</TITLE>
<CHAPTER ID= "F04010000000000" >
<TITLE ID= "F04010000000002" >READING= "CHAPTER TITLE"
<PARA ID= "F04010000000003" >CHAPTER TITLE</PARA>
</TITLE>
<SECTION ID= "F04020000000000" >
<TITLE ID= "F04020000000002" >READING= "SECTION TITLE"
<PARA ID= "F04020000000003" >SECTION TITLE</PARA>
</TITLE>
<DOCITEM ID= "F04020000000004" >
<PARA ID= "F04020000000005" >TEXT</PARA>
</DOCITEM></SECTION></CHAPTER></PART></BOOK>
```

FIG. 5B

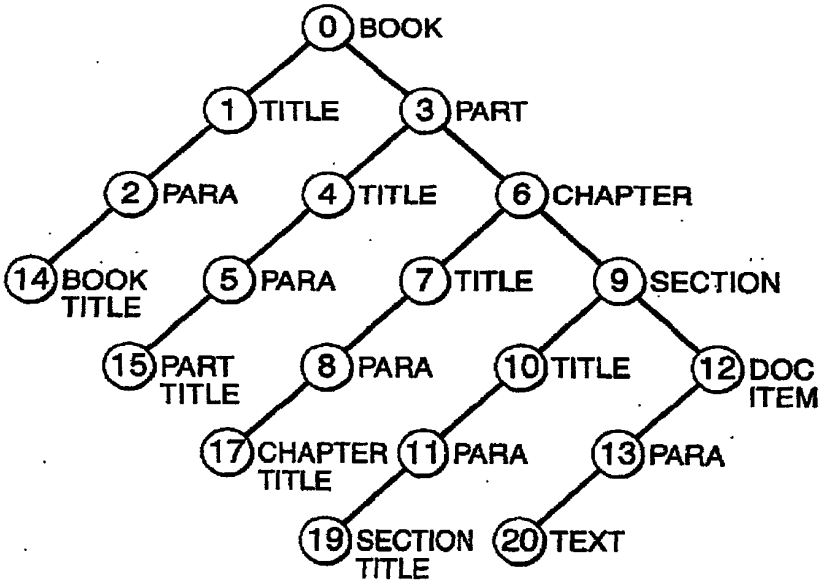

FIG. 6A

EDITING UNIT ID= 0, GID= 0

```
<BOOK ID= "F00000000000000" >
<TITLE ID= "F00000000000001" >READING= "BOOK TITLE"
<PARA ID= "F00000000000002" >BOOK TITLE</PARA>
</TITLE>
<PART ID= F04000000000000 >
<TITLE ID= "F04000000000002" >READING= "PART TITLE"
<PARA ID= "F04000000000003" >PART TITLE</PARA>
</TITLE> &E001; </PART></BOOK>
```

FIG. 6B

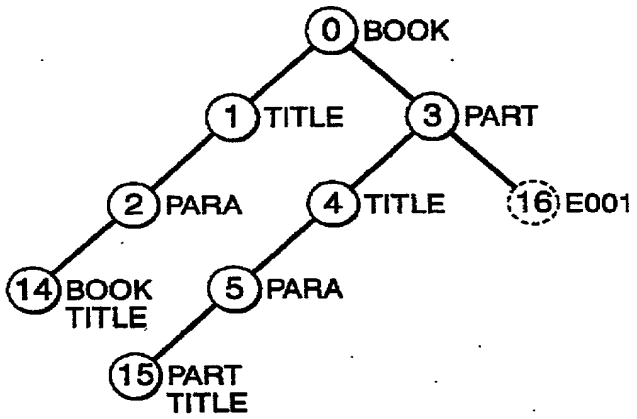

FIG. 7A

EDITING UNIT ID= 1, GID= 1

```
<CHAPTER ID= F04010000000000 >
<TITLE ID= "F04010000000002" >READING= "CHAPTER TITLE"
<PARA ID= "F04010000000003" >CHAPTER TITLE</PARA>
</TITLE> &E002; </CHAPTER>
```

FIG. 7B

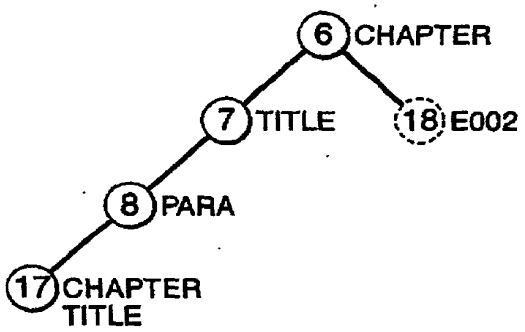

FIG. 8A

EDITING UNIT ID = 2, GID = 2

```
<SECTION ID= "F04020000000000" >
<TITLE ID= "F04020000000002" >READING= "SECTION TITLE"
<PARA ID= "F04020000000003" >SECTION TITLE</PARA>
</TITLE>
<DOC ITEM ID= "F04020000000004" >
<PARA ID= "F04020000000005" >TEXT</PARA>
</DOC ITEM></SECTION>
```

FIG. 8B

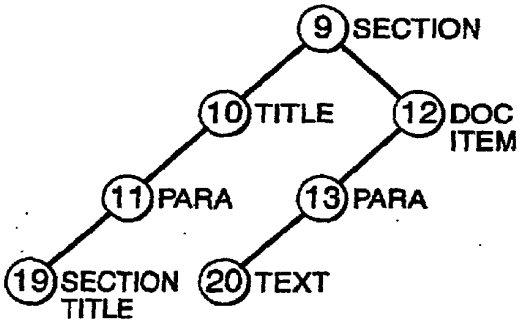

FIG. 9A

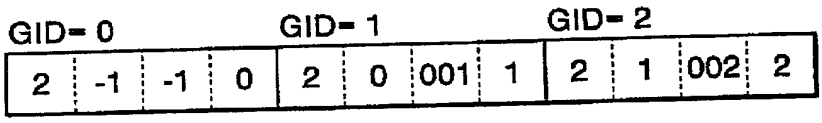

FIG. 9B

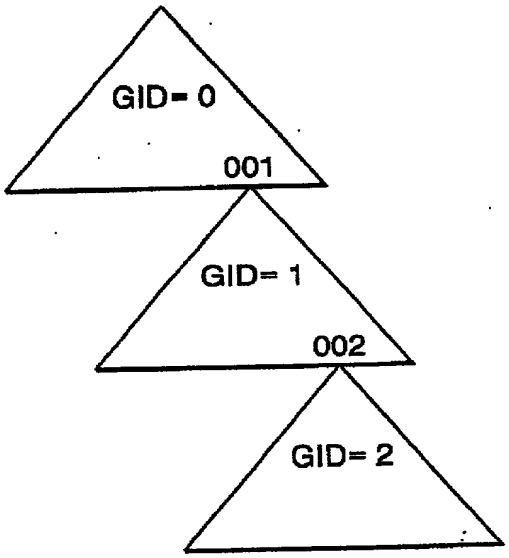

FIG. 10A

NODE TABLE

SNo	LNo	EDITING UNIT ID	ELEMENT NAME	DOCUMENT ID	ADDED VERSION	DELETED VERSION	MOUNT POINT NUMBER
0	0	0	BOOK	0	1	NULL	1
1	1	0	TITLE	0	1	NULL	0
2	2	0	PARA	0	1	NULL	0
3	3	0	PART	0	1	NULL	1
4	4	0	TITLE	0	1	NULL	0
5	5	0	PARA	0	1	NULL	0
6	0	1	CHAPTER	0	1	NULL	1
7	1	1	TITLE	0	1	NULL	0
8	2	1	PARA	0	1	NULL	0
9	0	2	SECTION	0	1	NULL	0
10	1	2	TITLE	0	1	NULL	0
11	2	2	PARA	0	1	NULL	0
12	3	2	DOCITEM	0	1	NULL	0
13	4	2	PARA	0	1	NULL	0

FIG. 10B

ATTRIBUTE TABLE

SNo	ATTRIBUTE NAME	ATTRIBUTE VALUE
0	ID	F00000000000000
1	ID	F00000000000001
1	READING	BOOK TITLE
2	ID	F00000000000002
3	ID	F04000000000000
4	ID	F04000000000002
4	READING	PART TITLE
5	ID	F04000000000003
6	ID	F04010000000000
7	ID	F04010000000002
7	READING	CHAPTER TITLE
8	ID	F04010000000003
9	ID	F04020000000000
10	ID	F04020000000002
10	READING	SECTION TITLE
11	ID	F04020000000003
12	ID	F04020000000004
13	ID	F04020000000005

FIG. 11

TEXT TABLE

SNo	LNo	EDITING UNIT ID	ELEMENT VALUE	DOCUMENT ID	ADDED VERSION	DELETED VERSION
14	6	0	BOOK TITLE	0	1	NULL
15	7	0	PART TITLE	0	1	NULL
16	8	0	E001	0	1	NULL
17	3	1	CHAPTER TITLE	0	1	NULL
18	4	1	E002	0	1	NULL
19	5	2	SECTION TITLE	0	1	NULL
20	6	2	TEXT	0	1	NULL

FIG. 12

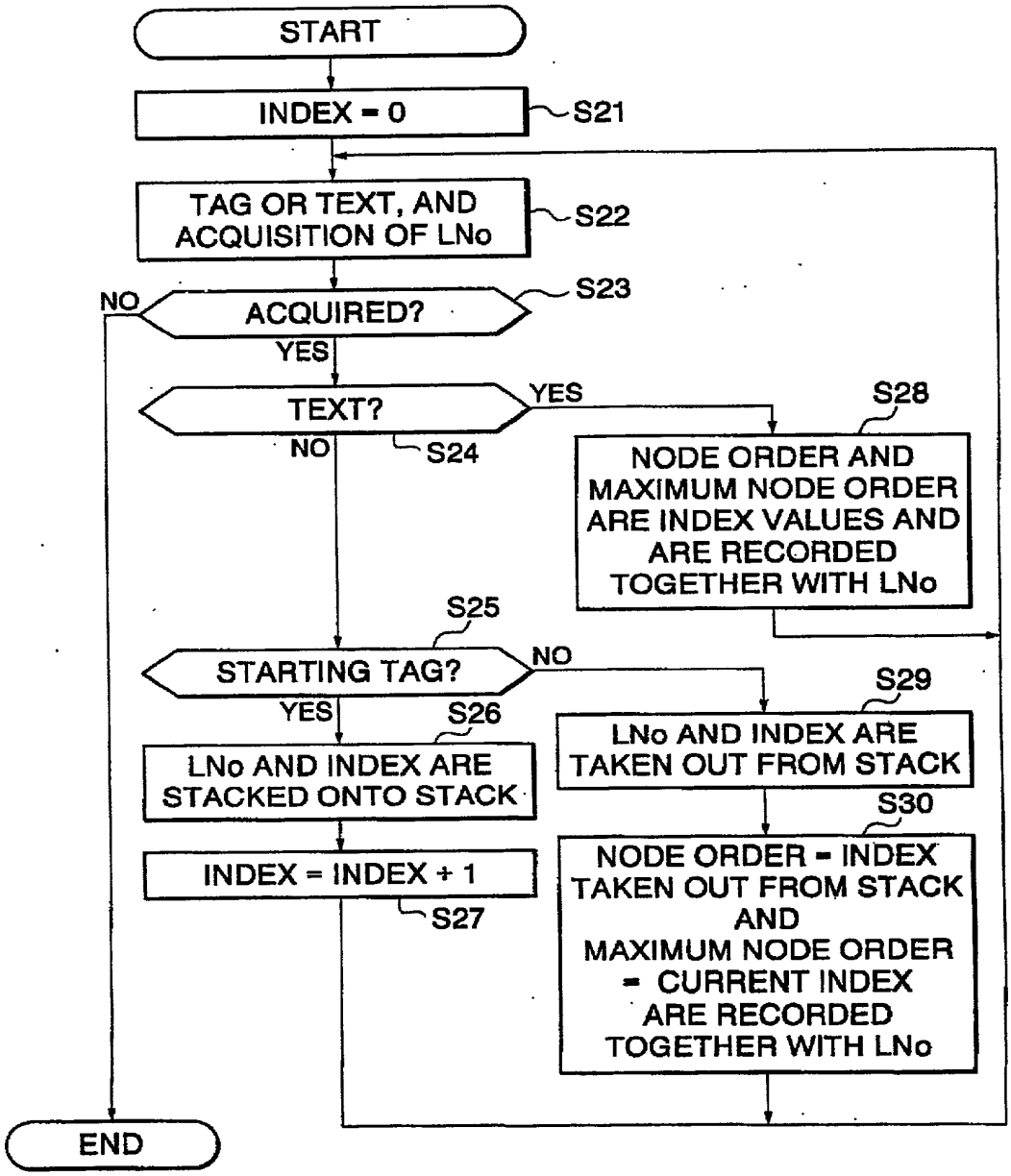
START
INDEX = 0
S21
TAG OR TEXT, AND ACQUISITION OF LNo
S22
NO
ACQUIRED?
S23
YES
TEXT?
YES
S28
NO
S24
NODE ORDER AND MAXIMUM NODE ORDER ARE INDEX VALUES AND ARE RECORDED TOGETHER WITH LNo
S25
STARTING TAG?
NO
S29
YES
S26
LNo AND INDEX ARE STACKED ONTO STACK
LNo AND INDEX ARE TAKEN OUT FROM STACK
S30
INDEX = INDEX + 1
S27
NODE ORDER = INDEX TAKEN OUT FROM STACK AND MAXIMUM NODE ORDER = CURRENT INDEX ARE RECORDED TOGETHER WITH LNo
END

FIG. 13

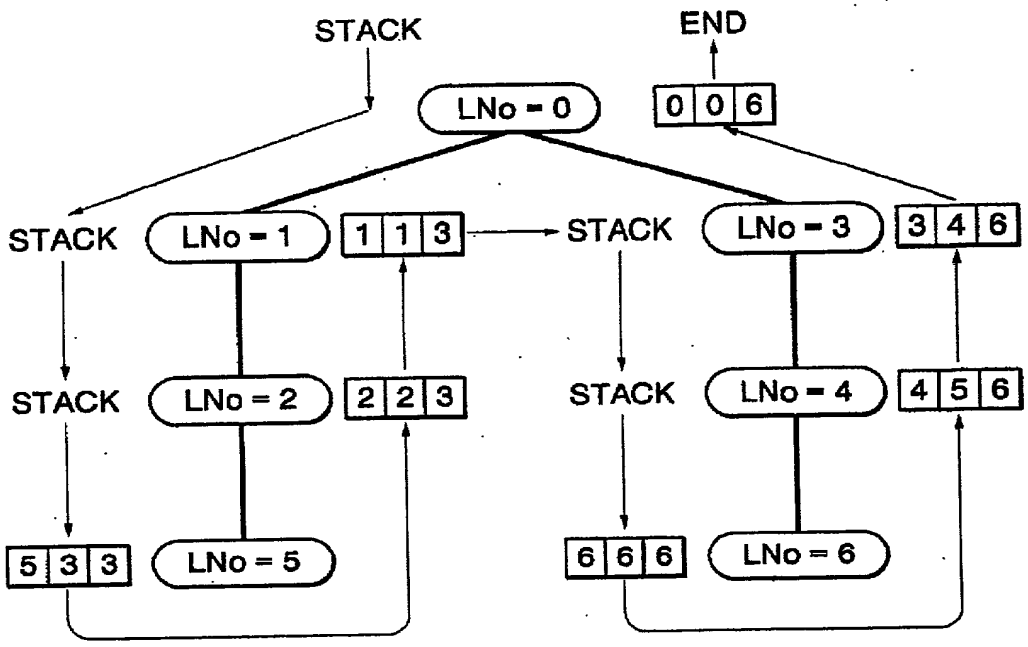
STACK
END
LNo = 0
0 0 6
STACK
LNo = 1
1 1 3
STACK
LNo = 3
3 4 6
STACK
LNo = 2
2 2 3
STACK
LNo = 4
4 5 6
5 3 3
LNo = 5
6 6 6
LNo = 6

FIG. 14A

EDITING UNIT ID = 0,
CLUSTER ID = 0

LNo	NODE ORDER	MAXIMUM NODE ORDER
0	0	8
1	1	3
2	2	3
3	4	8
4	5	7
5	6	7
6	3	3
7	7	7
8	8	8

FIG. 14B

EDITING UNIT ID = 1,
CLUSTER ID = 1

LNo	NODE ORDER	MAXIMUM NODE ORDER
0	0	4
1	1	3
2	2	3
3	3	3
4	4	4

FIG. 14C

EDITING UNIT ID = 2,
CLUSTER ID = 2

LNo	NODE ORDER	MAXIMUM NODE ORDER
0	0	6
1	1	3
2	2	3
3	4	6
4	5	6
5	3	3
6	6	6

FIG. 14D

VERSION TABLE

CLUSTER ID	EDITING UNIT ID	VERSION	DOCUMENT ID
0	0	1	0
1	1	1	0
2	2	1	0

FIG. 15

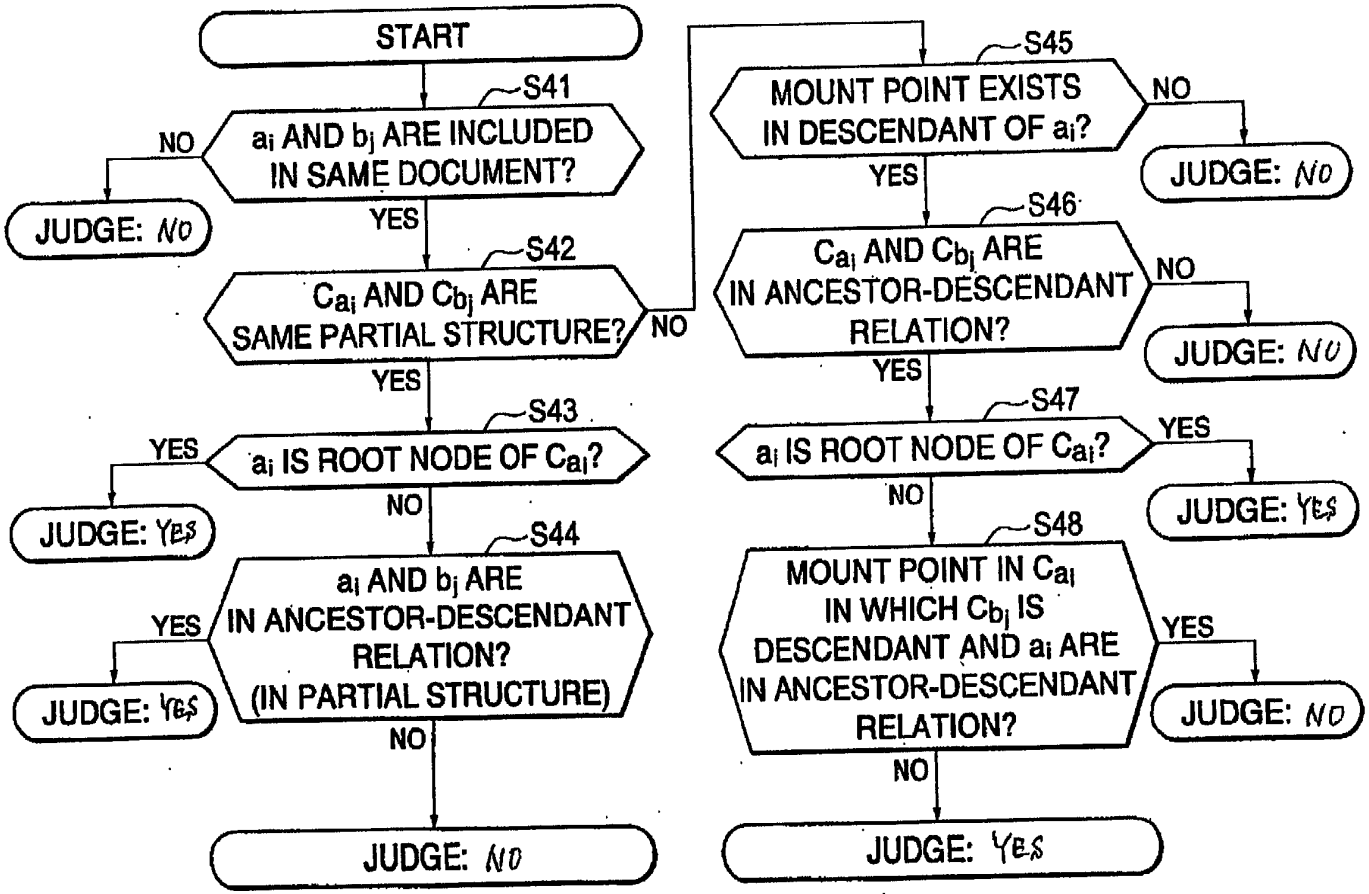
START
S41
a_i AND b_j ARE INCLUDED IN SAME DOCUMENT?
NO
JUDGE: NO
YES
S42
Ca_i AND Cb_j ARE SAME PARTIAL STRUCTURE?
NO
YES
S43
a_i IS ROOT NODE OF Ca_i?
YES
JUDGE: YES
NO
S44
a_i AND b_j ARE IN ANCESTOR-DESCENDANT RELATION? (IN PARTIAL STRUCTURE)
YES
JUDGE: YES
NO
JUDGE: NO
S45
MOUNT POINT EXISTS IN DESCENDANT OF a_i?
NO
JUDGE: NO
YES
S46
Ca_i AND Cb_j ARE IN ANCESTOR-DESCENDANT RELATION?
NO
JUDGE: NO
YES
S47
a_i IS ROOT NODE OF Ca_i?
YES
JUDGE: YES
NO
S48
MOUNT POINT IN Ca_i IN WHICH Cb_j IS DESCENDANT AND a_i ARE IN ANCESTOR-DESCENDANT RELATION?
YES
JUDGE: NO
NO
JUDGE: YES

FIG. 16A

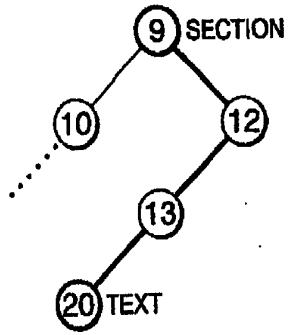

FIG. 16B

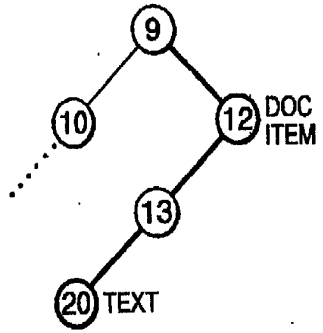

FIG. 16C

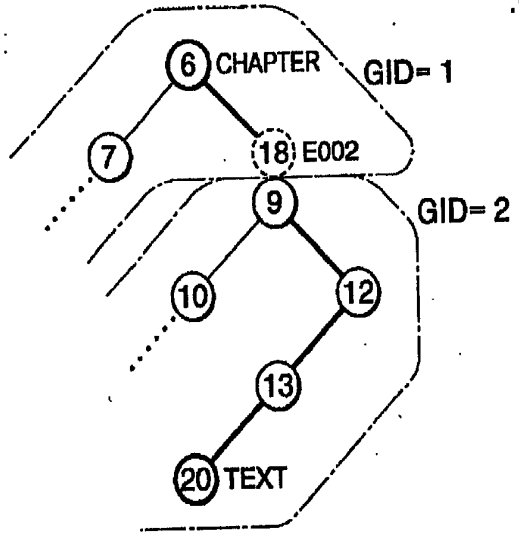

FIG. 16D

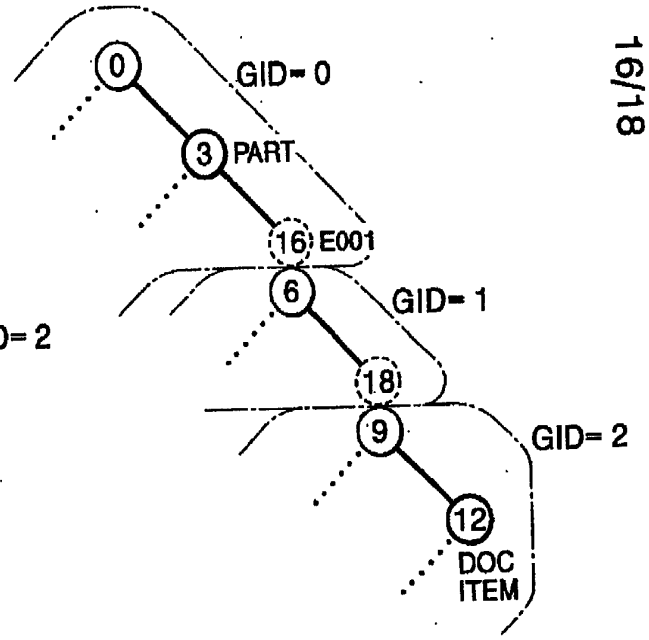

FIG. 17A

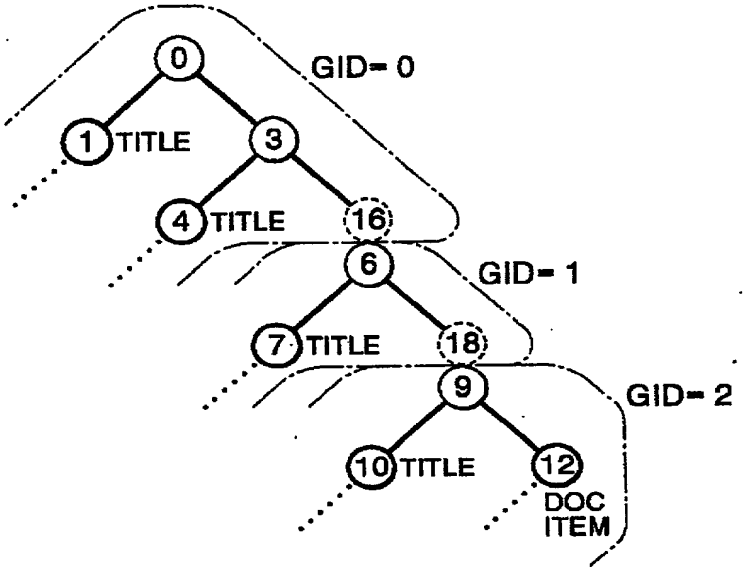
0
GID= 0
1 TITLE
3
4 TITLE
16
6
GID= 1
7 TITLE
18
9
GID= 2
10 TITLE
12
DOC
ITEM

FIG. 17B

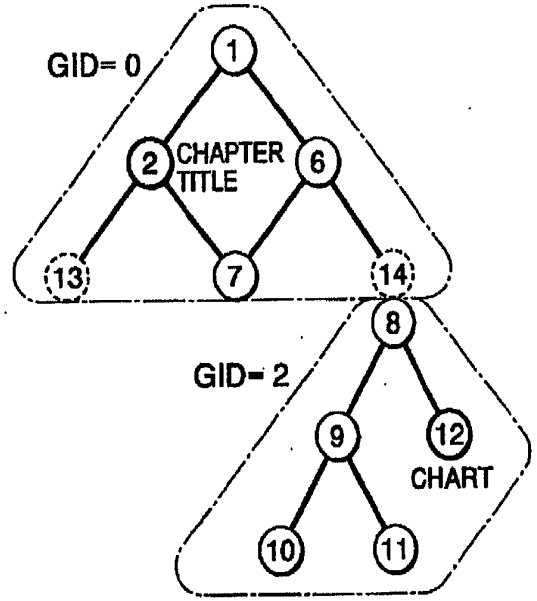
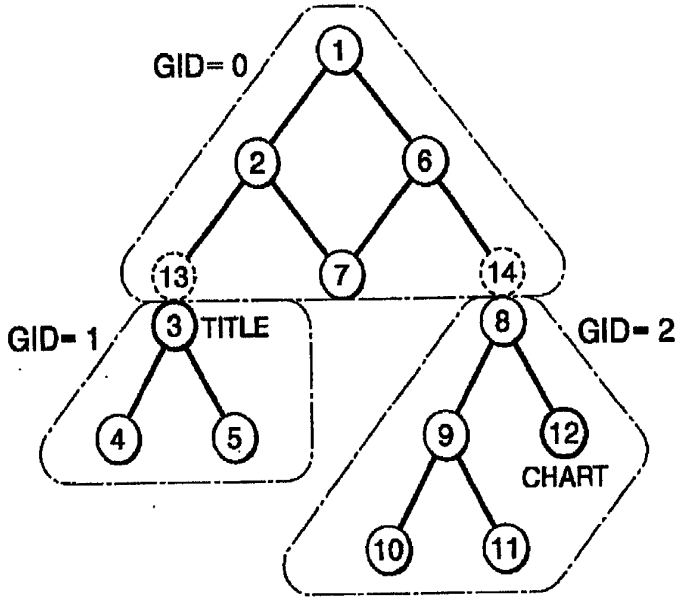
FIG. 17C